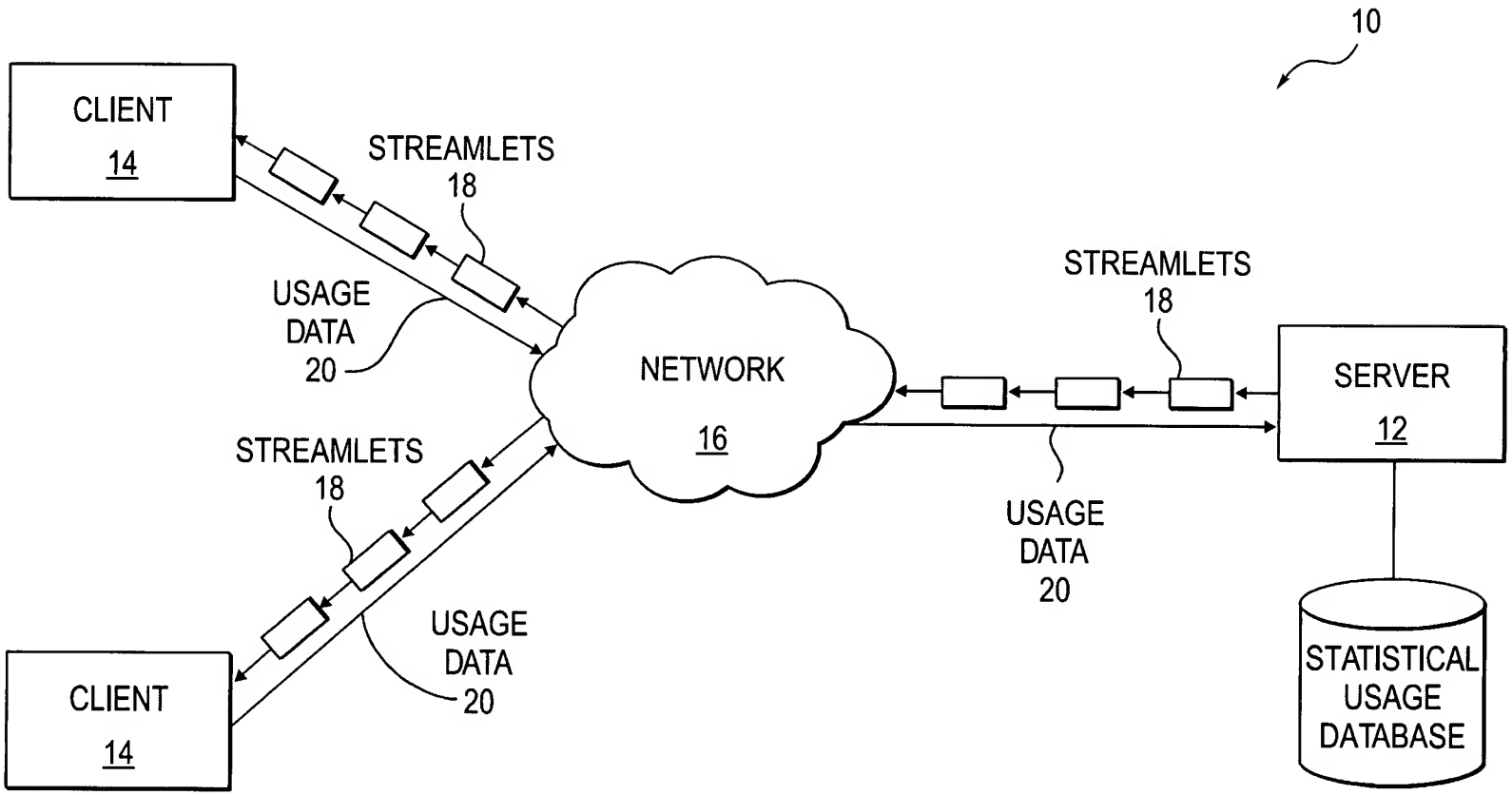
10
CLIENT
14
STREAMLETS
18
USAGE
DATA
20
NETWORK
16
STREAMLETS
18
SERVER
12
STREAMLETS
18
USAGE
DATA
20
USAGE
DATA
20
CLIENT
14
STATISTICAL
USAGE
DATABASE

FIG. 1

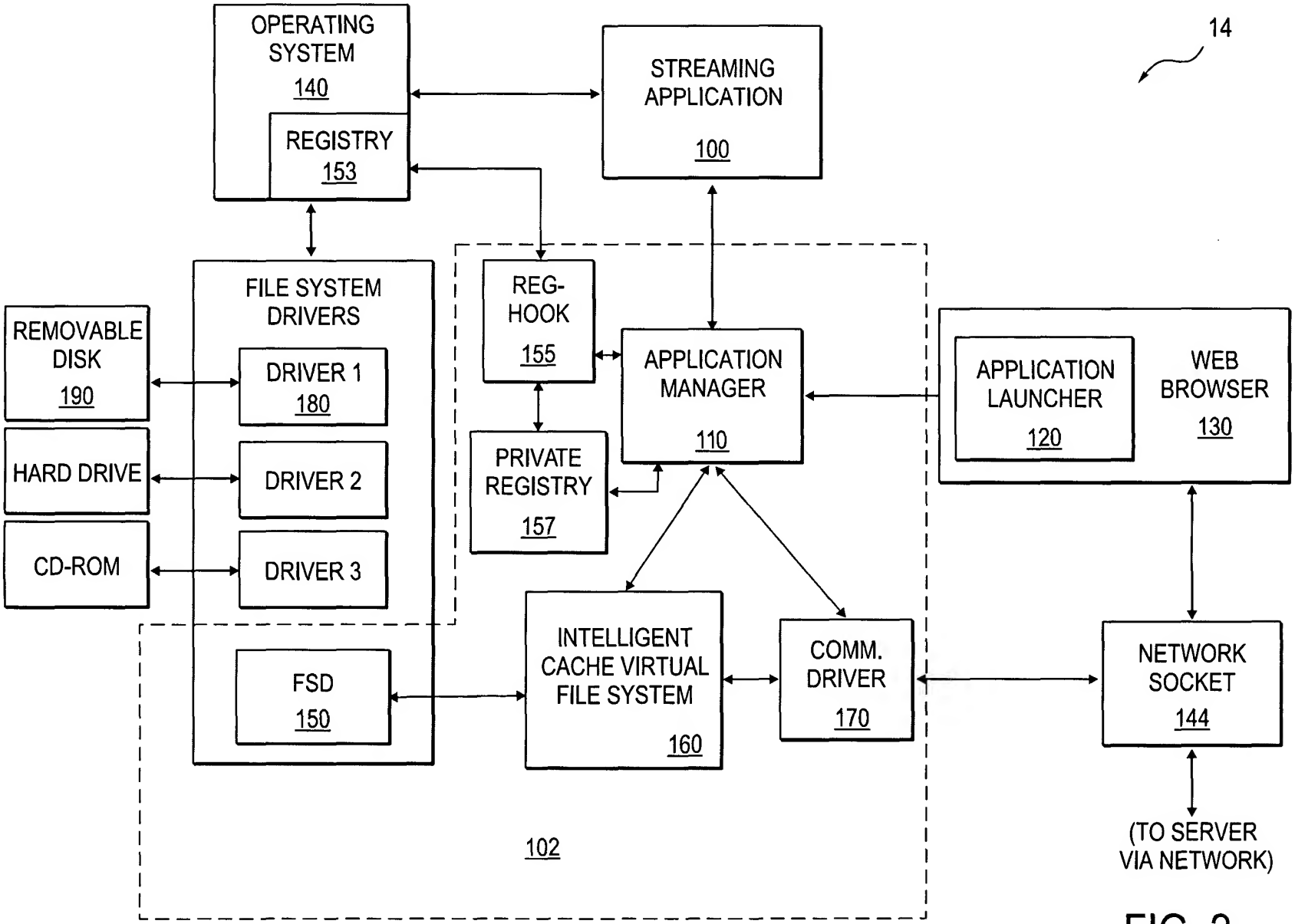
14
OPERATING SYSTEM
140
REGISTRY
153
STREAMING APPLICATION
100
FILE SYSTEM DRIVERS
REG-HOOK
155
APPLICATION MANAGER
110
APPLICATION LAUNCHER
120
WEB BROWSER
130
REMOVABLE DISK
190
HARD DRIVE
CD-ROM
DRIVER 1
180
DRIVER 2
DRIVER 3
PRIVATE REGISTRY
157
FSD
150
INTELLIGENT CACHE VIRTUAL FILE SYSTEM
160
COMM. DRIVER
170
NETWORK SOCKET
144
(TO SERVER VIA NETWORK)
102

FIG. 2

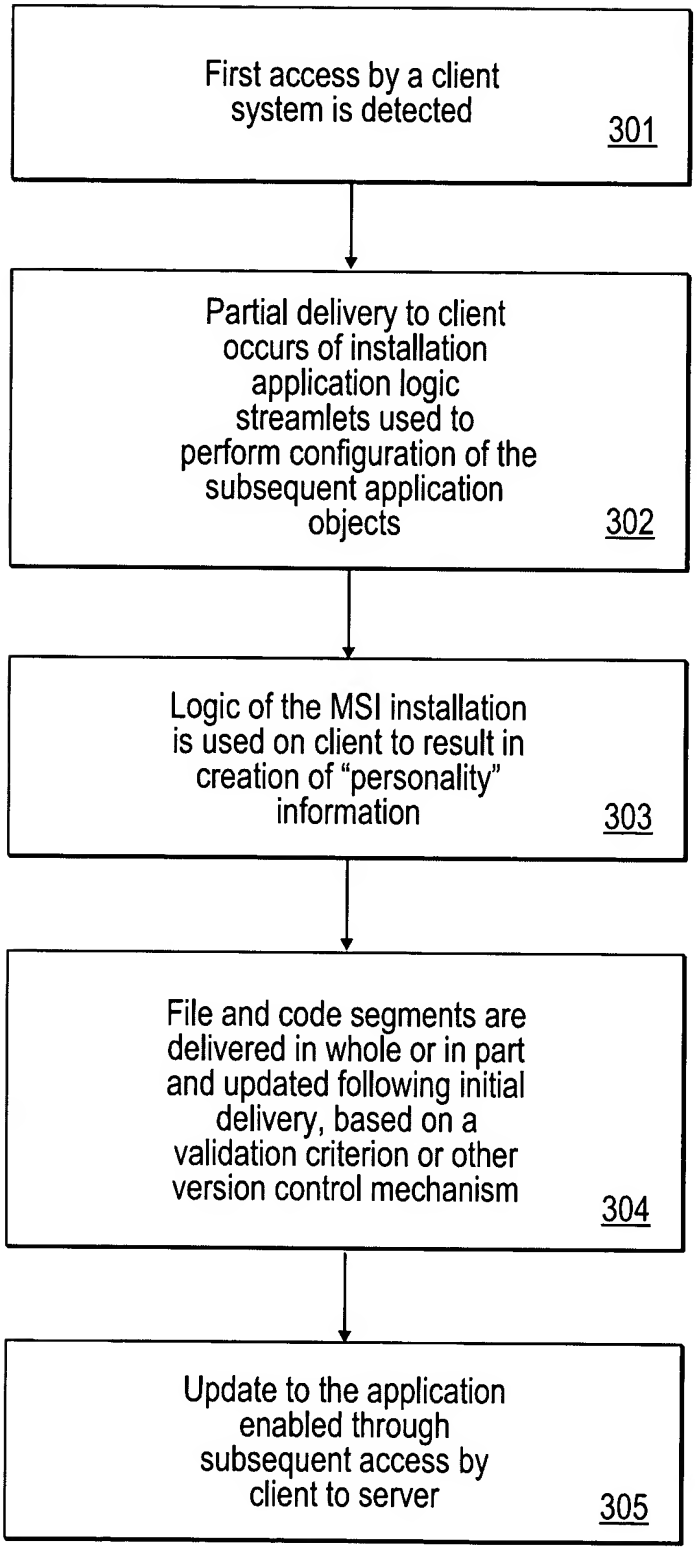
First access by a client system is detected
301
Partial delivery to client occurs of installation application logic streamlets used to perform configuration of the subsequent application objects
302
Logic of the MSI installation is used on client to result in creation of "personality" information
303
File and code segments are delivered in whole or in part and updated following initial delivery, based on a validation criterion or other version control mechanism
304
Update to the application enabled through subsequent access by client to server
305

FIG.3

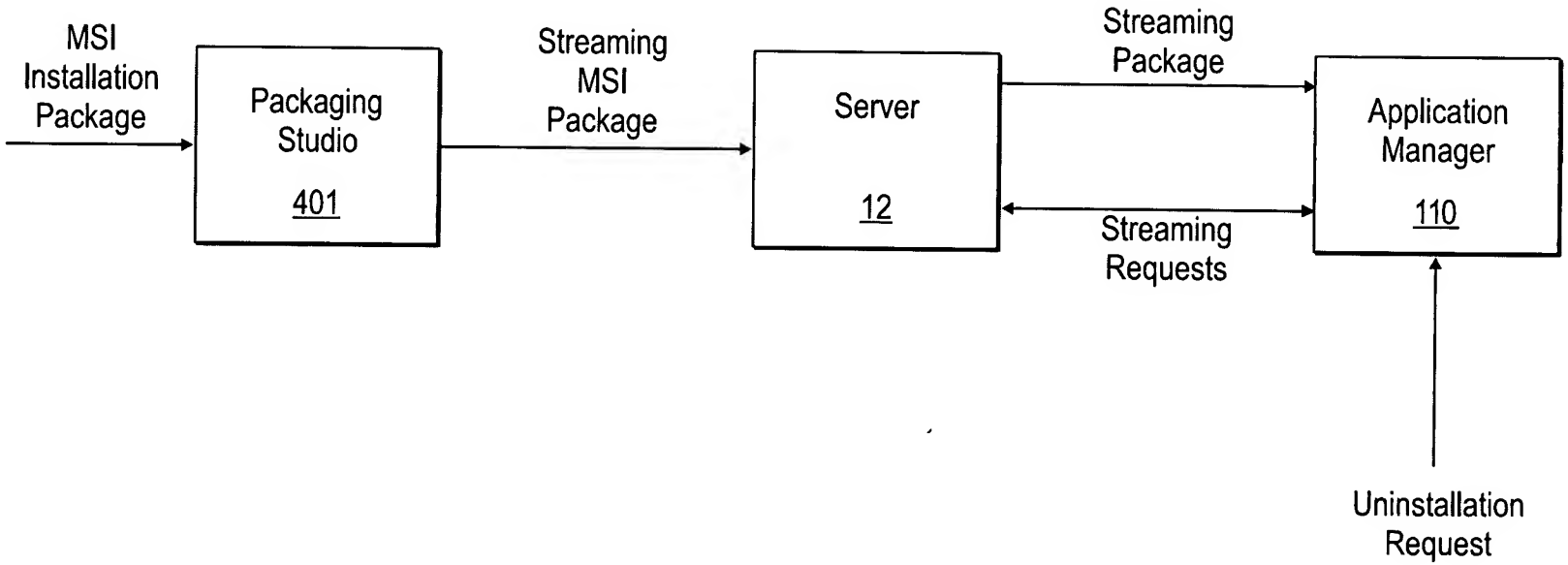
MSI
Installation
Package
Packaging
Studio
401
Streaming
MSI
Package
Server
12
Streaming
Package
Streaming
Requests
Application
Manager
110
Uninstallation
Request

FIG. 4

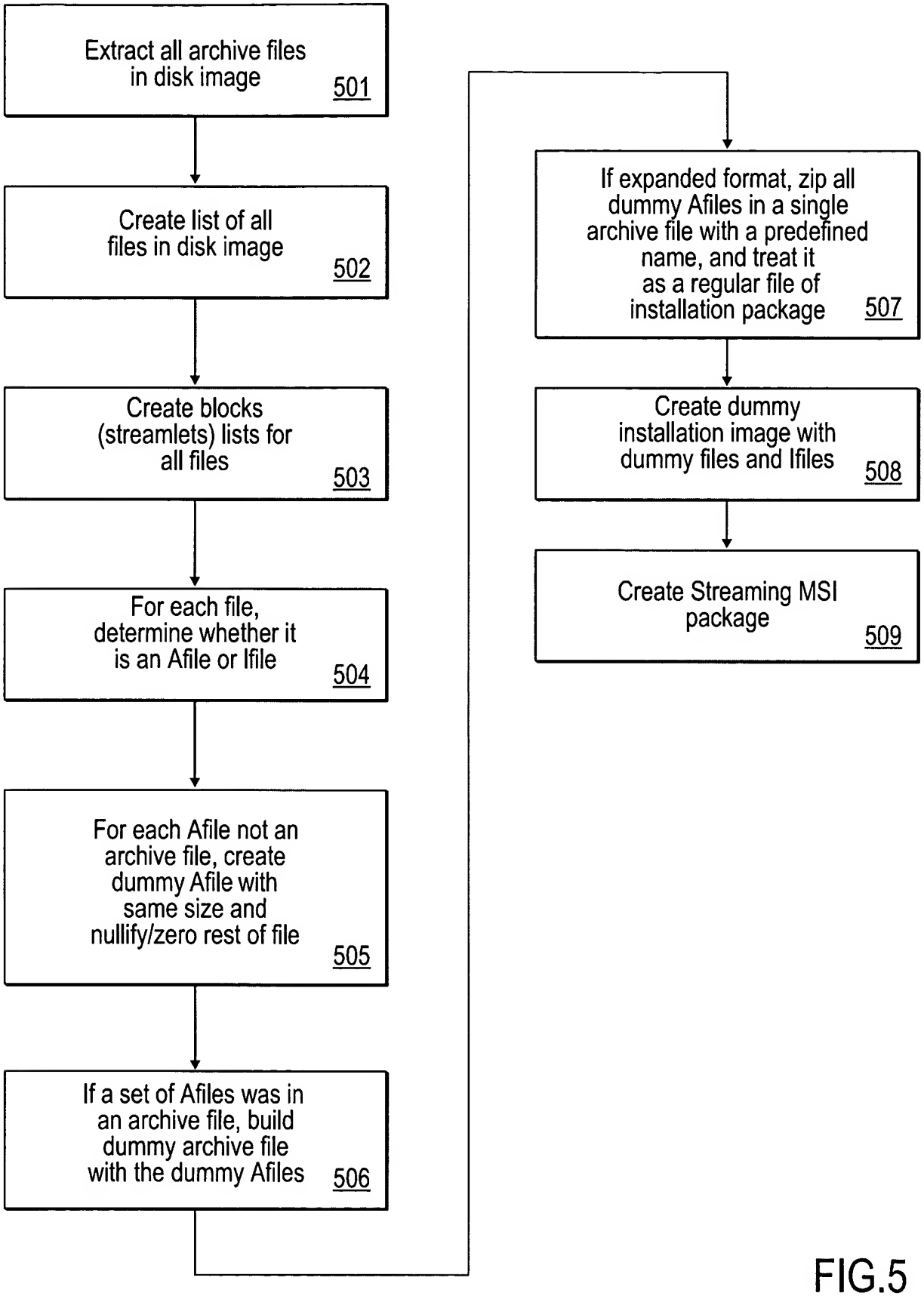
Extract all archive files in disk image
501
Create list of all files in disk image
502
Create blocks (streamlets) lists for all files
503
For each file, determine whether it is an Afile or Ifile
504
For each Afile not an archive file, create dummy Afile with same size and nullify/zero rest of file
505
If a set of Afiles was in an archive file, build dummy archive file with the dummy Afiles
506
If expanded format, zip all dummy Afiles in a single archive file with a predefined name, and treat it as a regular file of installation package
507
Create dummy installation image with dummy files and Ifiles
508
Create Streaming MSI package
509

FIG.5

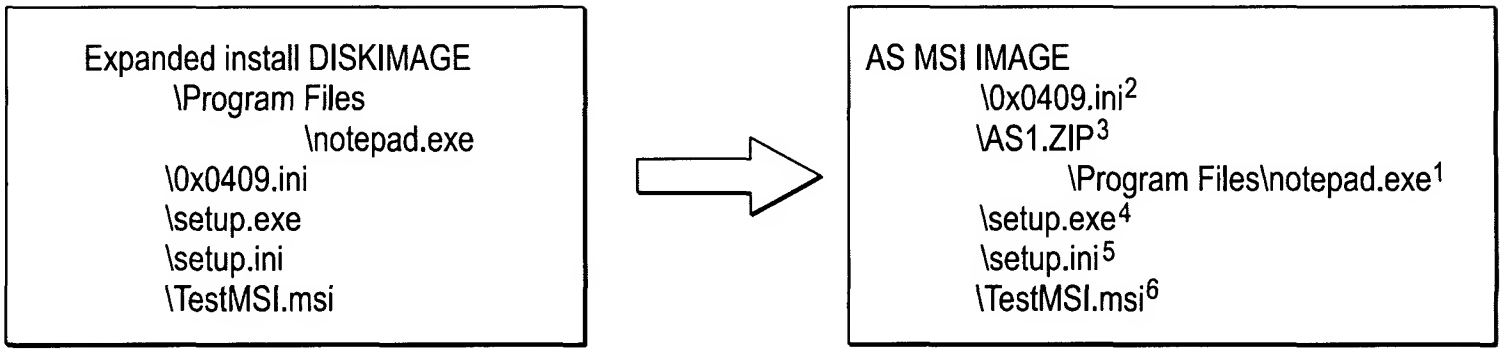
Expanded install DISKIMAGE
\Program Files
\notepad.exe
\0x0409.ini
\setup.exe
\setup.ini
\TestMSI.msi
AS MSI IMAGE
\0x0409.ini2
\AS1.ZIP3
\Program Files\notepad.exe1
\setup.exe4
\setup.ini5
\TestMSI.msi6

FIG. 6

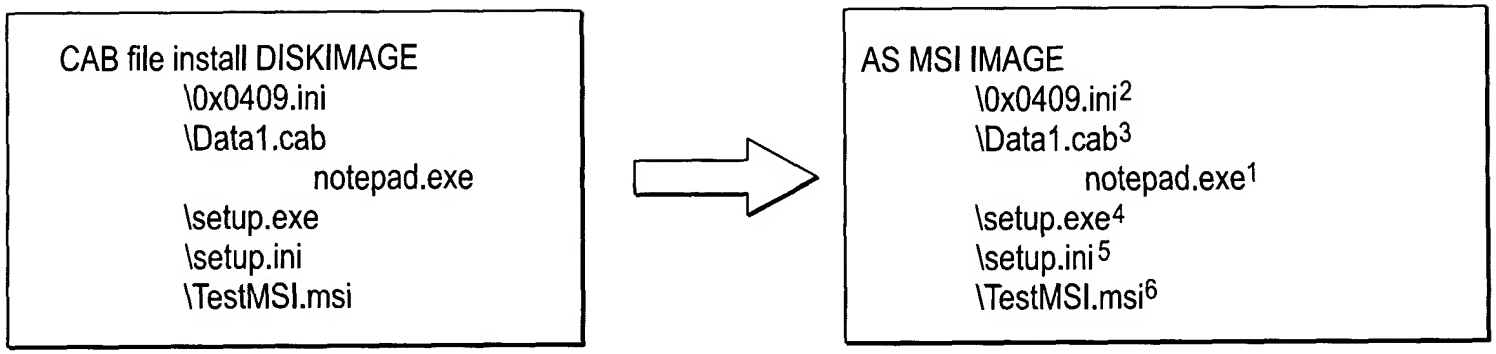
CAB file install DISKIMAGE
\0x0409.ini
\Data1.cab
notepad.exe
\setup.exe
\setup.ini
\TestMSI.msi
AS MSI IMAGE
\0x0409.ini2
\Data1.cab3
notepad.exe1
\setup.exe4
\setup.ini5
\TestMSI.msi6

FIG. 7

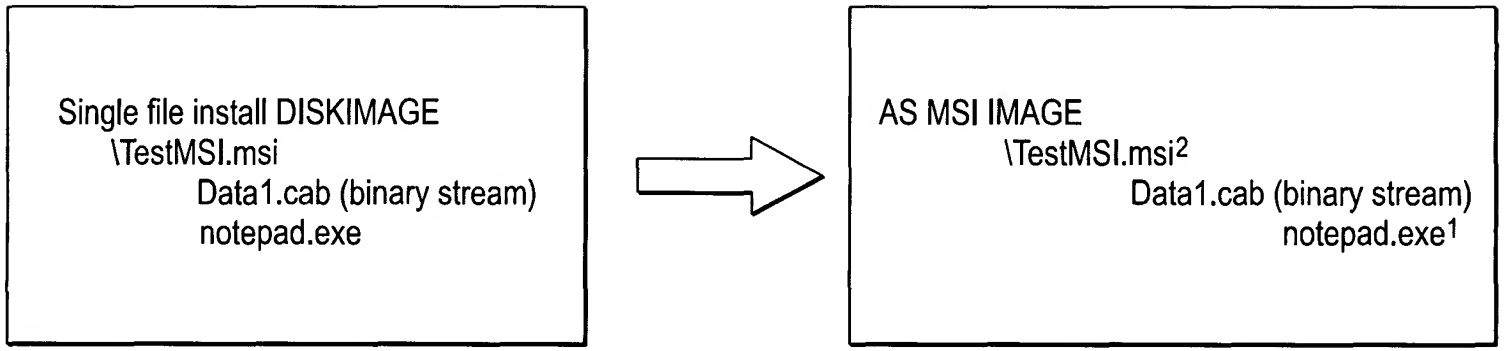
Single file install DISKIMAGE
\TestMSI.msi
Data1.cab (binary stream)
notepad.exe
AS MSI IMAGE
\TestMSI.msi2
Data1.cab (binary stream)
notepad.exe1

FIG. 8

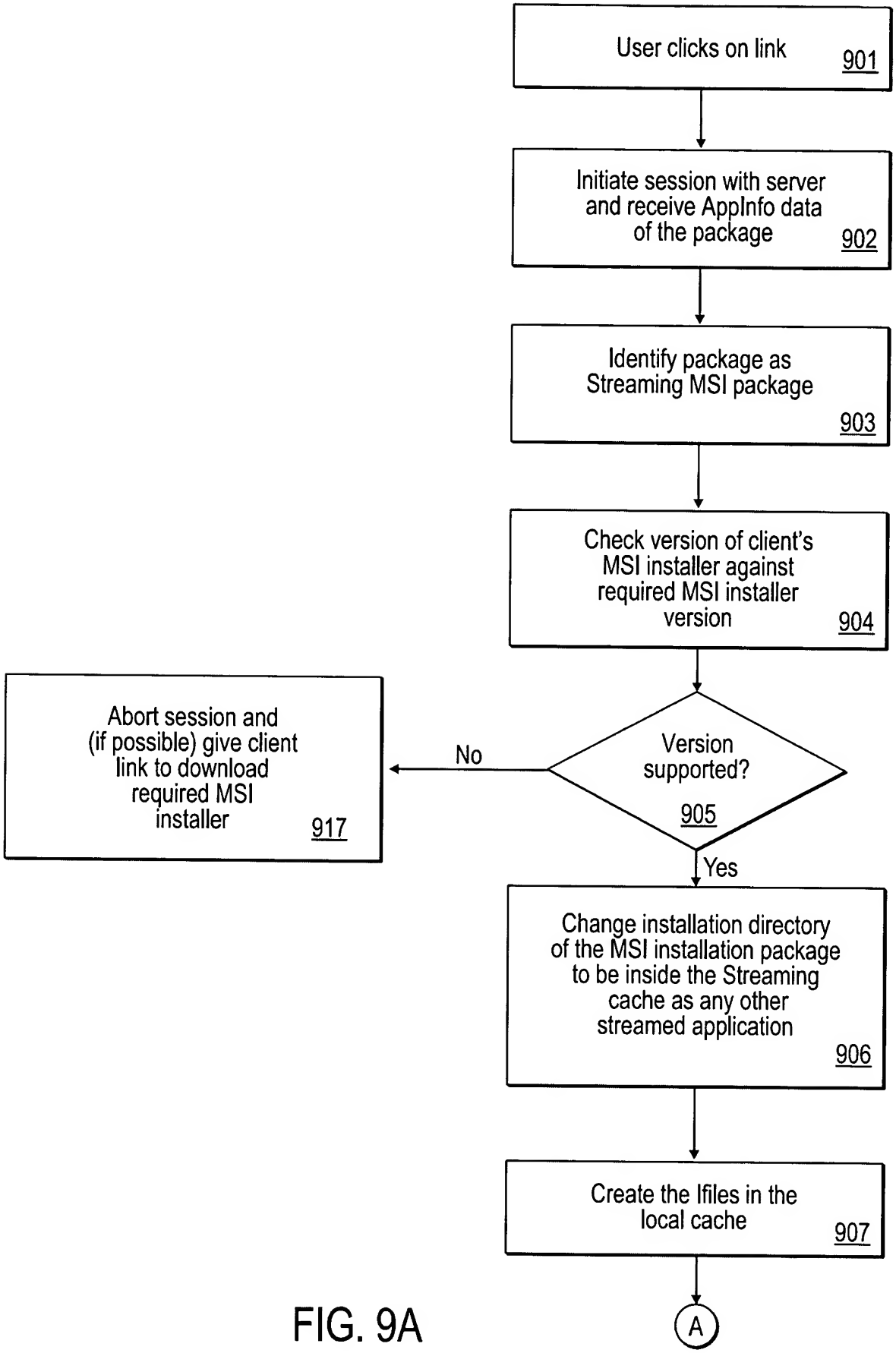
User clicks on link
901
Initiate session with server and receive AppInfo data of the package
902
Identify package as Streaming MSI package
903
Check version of client's MSI installer against required MSI installer version
904
Version supported?
905
No
Abort session and (if possible) give client link to download required MSI installer
917
Yes
Change installation directory of the MSI installation package to be inside the Streaming cache as any other streamed application
906
Create the Ifiles in the local cache
907
A

FIG. 9A

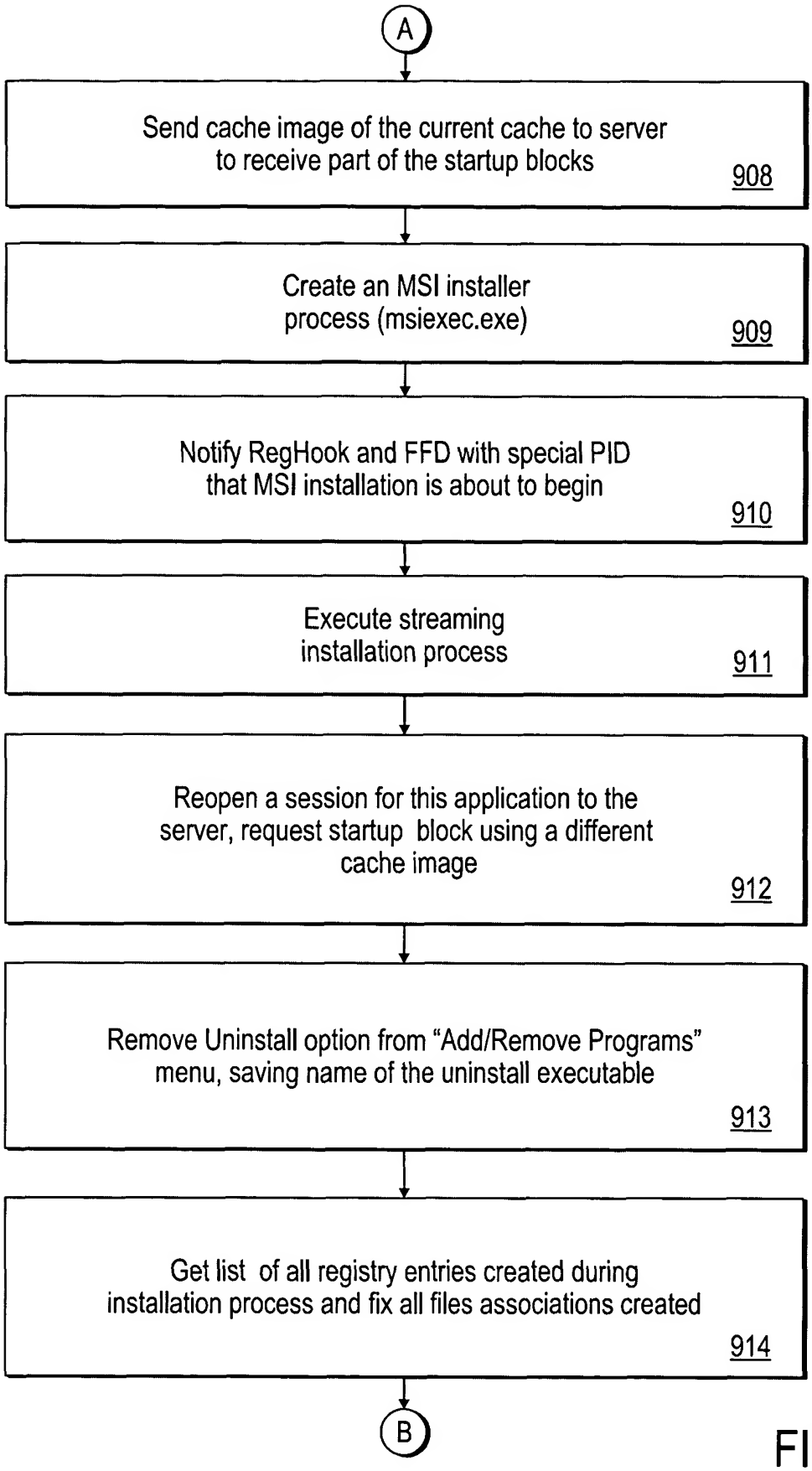
A
Send cache image of the current cache to server to receive part of the startup blocks
908
Create an MSI installer process (msiexec.exe)
909
Notify RegHook and FFD with special PID that MSI installation is about to begin
910
Execute streaming installation process
911
Reopen a session for this application to the server, request startup block using a different cache image
912
Remove Uninstall option from "Add/Remove Programs" menu, saving name of the uninstall executable
913
Get list of all registry entries created during installation process and fix all files associations created
914
B

FIG. 9B

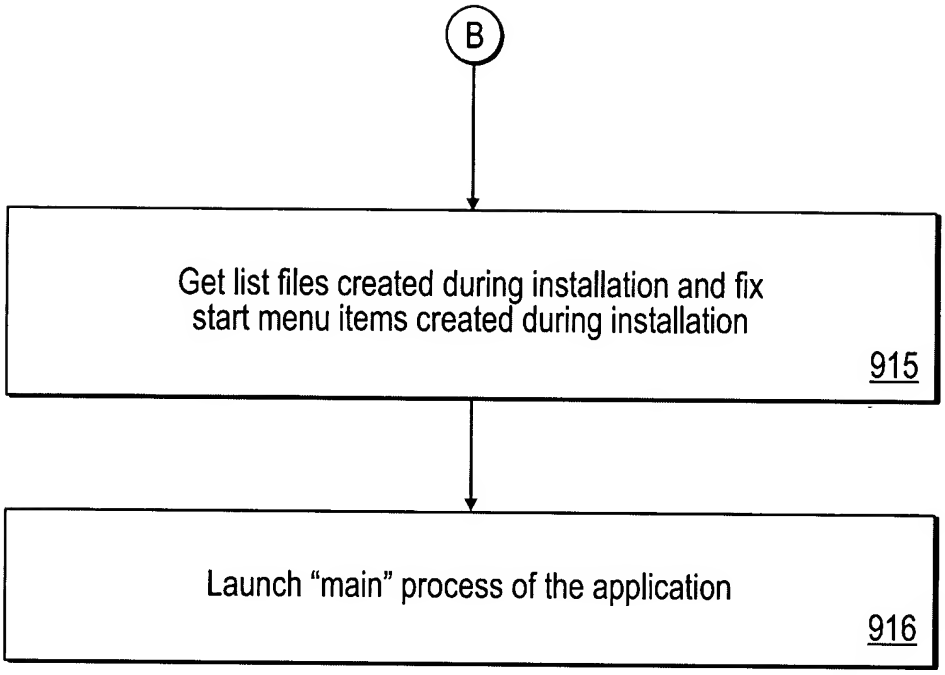
B
Get list files created during installation and fix start menu items created during installation
915
Launch "main" process of the application
916

FIG. 9C

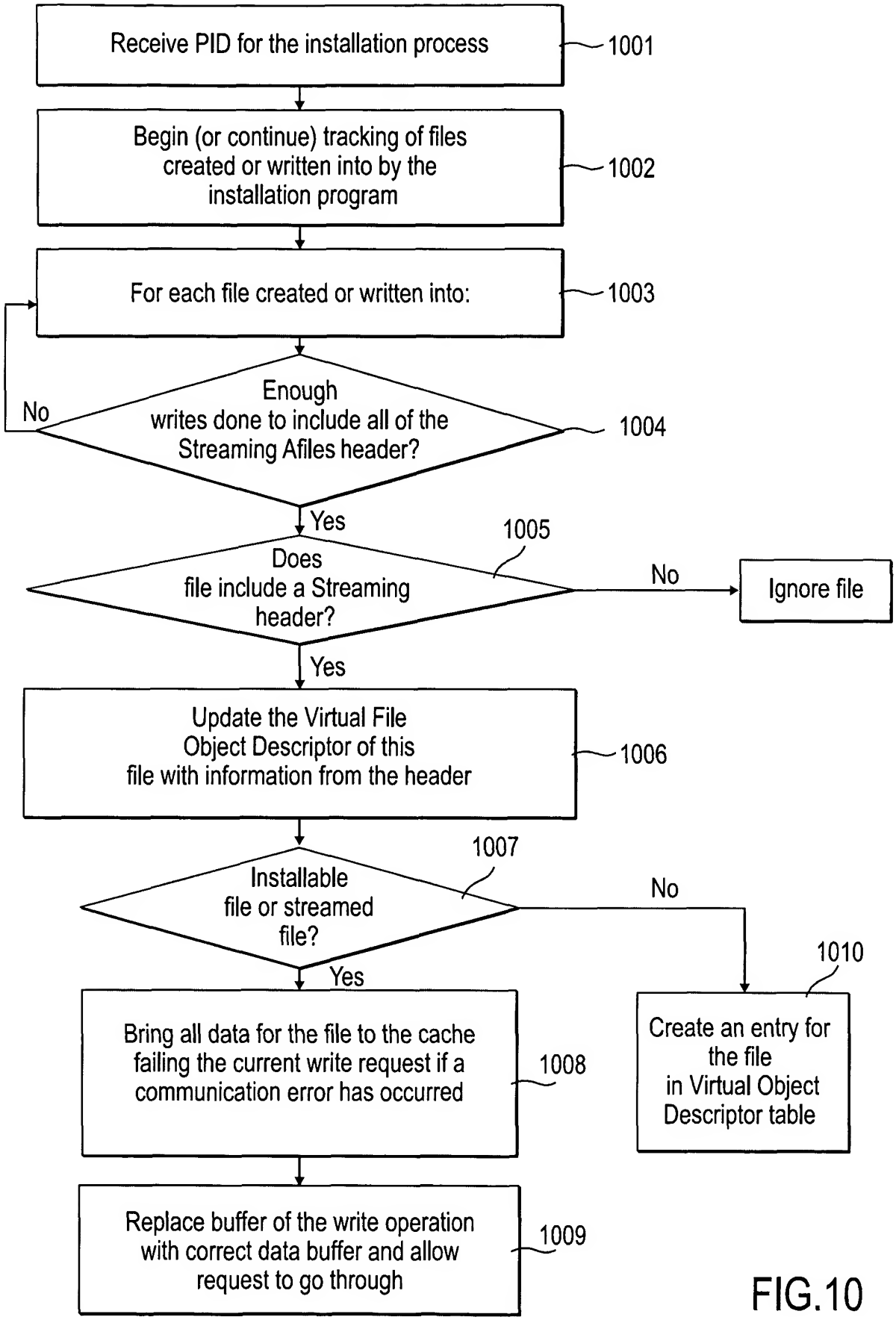
Receive PID for the installation process
1001
Begin (or continue) tracking of files created or written into by the installation program
1002
For each file created or written into:
1003
Enough writes done to include all of the Streaming Afiles header?
1004
No
Yes
1005
Does file include a Streaming header?
No
Ignore file
Yes
Update the Virtual File Object Descriptor of this file with information from the header
1006
1007
Installable file or streamed file?
No
1010
Yes
Bring all data for the file to the cache failing the current write request if a communication error has occurred
1008
Create an entry for the file in Virtual Object Descriptor table
Replace buffer of the write operation with correct data buffer and allow request to go through
1009

FIG.10